PATENT

Attorney Docket No. 015258-053900US
Client Reference No.: P.7057

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

MARTIN KELLER, et al.

Application No.: Not yet assigned

Filed: Herewith

For: METHOD FOR OPERATING A FUEL CELL BATTERY

PRELIMINARY AMENDMENT

San Francisco, CA 94111
September 21, 2001

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to the examination of the above-referenced application, please enter the following amendments and remarks.

IN THE ABSTRACT:

Please substitute the following amended, clean version of the Abstract (a marked-up version of the changes to the Abstract is attached to this Amendment):

METHOD FOR OPERATING A FUEL CELL BATTERY

ABSTRACT OF THE DISCLOSURE

The method for operating a fuel cell battery (1) comprises an analysis of an integrity state of the battery. This integrity state is determined by means of measurement of operating parameters and a programmed evaluation of the measurement data. The battery is controlled for the purpose of reliable operation in such a manner that the maximum electrical output power is subjected to a limitation which is dependent on the integrity state or an interruption of the operation is initiated. The integrity state can be characterized by at least two parameters, in particular a parameter pair c_j, d_j. From a relationship which contains the parameters an internal electrical resistance (R_i) of the battery can be calculated on the one hand and a statement on the quality of the battery can be derived on the other hand.

IN THE CLAIMS:

Please substitute the following amended, clean versions of the indicated claims (a marked-up version of the changes to the claims is attached to this Amendment):

3. (amended) Method in accordance with claim 1, characterized in that a mathematical relationship (II) exists between the internal resistance (Ri) and an amount of fuel (QF) which is fed into the battery; and in that the parameters cj, dj enter into this relationship as proportionality factor or as exponent respectively.

4. (amended) Method in accordance with claim 1, characterized in that current values of the parameter pair c_j, d_j are determined by means of periodically carried out diagnostic measurements and by carrying out digital computations (IV – X"); and in that as a result of these values the control of the battery is adapted where appropriate; or in that, depending on the integrity state, a message is displayed that a replacement of the fuel cells is required.

7. (amended) Method in accordance with claim 2, characterized in that the monitoring of the afterburning is carried out by means of a thermo-generator (31).

8. (amended) Method in accordance with claim 2, characterized in that the monitoring of the afterburning is carried out by means of a UV probe (31) or an ionization measurement.

9. (amended) Method in accordance with claim 2, characterized in that the monitoring of the afterburning is carried out by means of a CO sensor which is arranged in the exhaust gas flow.

10. (amended) Plant with a fuel cell battery (1), in which the method in accordance with claim 1 is used, characterized by a control device (8) and an adaptation device (10) for carrying out the method.

REMARKS:

Claims 1-10 are pending.

Amendment is made to delete a minor informality in the Abstract and to eliminate all multiple dependencies from the claims, thereby avoiding the need to pay the multiple dependent surcharge.

Respectfully submitted,

Kevin T. LeMond
Reg. No. 35,933

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, 8th Floor
San Francisco, California 94111-3834
Tel: (415) 576-0200
Fax: (415) 576-0300
KTL/dxm
SF 1271920 v1

MARKED-UP VERSION OF THE CHANGES TO THE ABSTRACT

Abstract of disclosure:

The method for operating a fuel cell battery (1) comprises an analysis of an integrity state of the battery. This integrity state is determined by means of measurement of operating parameters and a programmed evaluation of the measurement data. The battery is controlled for the purpose of reliable operation in such a manner that the maximum electrical output power is subjected to a limitation which is dependent on the integrity state or an interruption of the operation is initiated. The integrity state can be characterized by at least two parameters, in particular a parameter pair c_j, d_j. From a relationship which contains the parameters an internal electrical resistance (R_i) of the battery can be calculated on the one hand and a statement on the quality of the battery can be derived on the other hand.

[(Fig. 2)]

MARKED-UP VERSION OF THE CHANGES TO THE CLAIMS

3. (amended) Method in accordance with [claim 1 or claim 2] claim 1, characterized in that a mathematical relationship (II) exists between the internal resistance (Ri) and an amount of fuel (QF) which is fed into the battery; and in that the parameters cj, dj enter into this relationship as proportionality factor or as exponent respectively.

4. (amended) Method in accordance with [any one of the claims 1 to 3] claim 1, characterized in that current values of the parameter pair c_j, d_j are determined by means of periodically carried out diagnostic measurements and by carrying out digital computations (IV – X"); and in that as a result of these values the control of the battery is adapted where appropriate; or in that, depending on the integrity state, a message is displayed that a replacement of the fuel cells is required.

7. (amended) Method in accordance with [any one of the claims 2 to 6] claim 2, characterized in that the monitoring of the afterburning is carried out by means of a thermo-generator (31).

8. (amended) Method in accordance with [any one of the claims 2 to 6] claim 2, characterized in that the monitoring of the afterburning is carried out by means of a UV probe (31) or an ionization measurement.

9. (amended) Method in accordance with [any one of the claims 2 to 6] claim 2, characterized in that the monitoring of the afterburning is carried out by means of a CO sensor which is arranged in the exhaust gas flow.

10. (amended) Plant with a fuel cell battery (1), in which the method in accordance with [any one of the claims 1 to 9] claim 1 is used, characterized by a control device (8) and an adaptation device (10) for carrying out the method.